

WHAT IS CLAIMED IS:

1. An improved process for producing a solid-state imaging device comprising the steps of: forming a light-receiving portion of a pixel in a region on the substrate surface, forming a convex lens with an upwardly curved surface which is embedded in an inter-layer dielectric above said light-receiving portion, and forming an on-chip lens above said convex lens, wherein said improvement comprises forming sequentially said light-receiving portion, forming an inter-layer dielectric having a depression in its surface above said light-receiving portion, forming on said inter-layer dielectric a light transmitting film having in its surface a concave conforming to said depression, forming at the position that covers said concave on said light transmitting film a mask layer with a convexly curved surface, and etching said mask layer and said light transmitting film all together, thereby making said light transmitting film into a shape of said convex lens.

2. A process for producing a solid-state imaging device as defined in Claim 1, which further comprises, following the step of forming said light-receiving portion, the steps of forming electrodes to transfer charges generated by said light-receiving portion, said

electrodes being positioned above both sides of said light-receiving portion and being insulated from said substrate, forming a shielding film which covers the step of said charge transfer electrodes and opens above said light-receiving portion, said shielding film being insulated from said charge transfer electrodes, and forming said inter-layer dielectric covering said shielding film and its opening in such a way that said depression is formed in the surface of said inter-layer dielectric in conformity with the step of said charge transfer electrode and the step of said shielding film.

3. A process for producing a solid-state imaging device as defined in Claim 1, which further comprises, following the step of forming said light-receiving portion, the step of softening said inter-layer dielectric by heat treatment, thereby adjusting the depth of said depression.

4. A process for producing a solid-state imaging device as defined in Claim 1, which further comprises the steps of forming a resist pattern as said mask layer on said light transmitting film and softening said resist pattern by heat treatment, thereby adjusting the curvature of the surface of said resist pattern.

5. A process for producing a solid-state imaging

device as defined in Claim 1, which includes etching which is carried out under the condition that said mask layer and said light transmitting film have almost the same selectivity.

6. A solid-state imaging device having a light-receiving portion of a pixel formed in a region on the substrate surface, a convex lens with an upwardly curved surface which is positioned above the light-receiving portion and embedded in an inter-layer dielectric, and an on-chip lens formed above said convex lens, characterized in that said convex lens is formed on the depression in the surface of the underlying inter-layer dielectric such that the lower part of the lens which is made of the light transmitting material filling said depression is integral with the upper part of the lens which is made of the same light transmitting material as that of the lower part of the lens and has the convexly curved lens surface.